Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation	)	ET Docket No. 93-62

REPLY OF COMSAT CORPORATION

COMSAT Corporation ("COMSAT"), through its COMSAT Mobile Communications Division, pursuant to Section 1.415 of the Commission's Rules, hereby submits its Reply to comments filed in response to the Notice of Proposed Rule Making ("NPRM"), ET Docket No. 93-62, adopted on March 11, 1993.[1]

DISCUSSION

COMSAT has reviewed the extensive series of comments filed in the instant proceeding some of which contain very sophisticated measurement data on specific absorption rates "SARs" for exposure of humans to handheld and vehicular mobile terminals. COMSAT agrees with the general consensus of the commentors to support, with certain qualifications, the adoption of the new 1992 radiofrequency ("RF") standards promulgated by the American National Standards Institute ("ANSI") in conjunction with the Institute of Electrical and Electronic Engineers ("IEEE").

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[1]The instant Reply is timely filed pursuant to the Commission's Order adopted January 7, 1994, which granted a third extension of time for filing comments and replies in this proceeding. Order DA 94-34, ET Docket No. 93-62, released January 10, 1994.

COMSAT's interest in this proceeding focuses on the treatment of existing portable and future handheld mobile satellite terminals. As the Signatory to the International Maritime Satellite Organization ("Inmarsat") and a provider of global satellite communications services, COMSAT has an established interest in portable RF facilities and equipment. Today, there are more than 30,000 "L" Band (1.5/1.6 GHz) maritime, land mobile and aeronautical mobile satellite terminals in use in the Inmarsat system which provide vital service to commercial, public safety and government users. Inmarsat also plans to introduce advanced mobile satellite services ("MSS"), including satellite-based personal communications services ("PCS") to handheld phones, in the new 1.9/2.1 GHz MSS bands which were allocated to MSS at the 1992 World Administrative Conference. Given the public benefit derived from these services, COMSAT believes it is important for the Commission, as it reviews the 1992 ANSI/IEEE RF exposure rules, to achieve an appropriate balance between the use of RF equipment and the protection of the public from potentially harmful RF radiation exposure.

COMSAT agrees with the majority of commentors which have found the new 1992 ANSI/IEEE guidelines to be very conservative, with more than adequate safety margins. In essence, under the 1992 guidelines, the uncontrolled maximum permissible exposure ("MPE") levels and the SARs for handheld devices are five times lower than the levels permitted in the 1982 ANSI/IEEE guidelines.

Experimental research with existing cellular phone technology conducted by Motorola and Dr. Om Gandhi at the University of Utah confirms that the actual SARs in the human head (carefully simulated) are from two to five times lower than even the more stringent 1992 guidelines. These results indicate that the overall safety factor built into the new 1992 guidelines is ten to twenty-five times more stringent than the 1982 guidelines. See Motorola Comments at 27-28 and Appendix E; McCaw Cellular Comments at 15. These recent SAR measurements reveal that there is generally less heating of internal tissues from RF exposure than had been anticipated. Even the new cellular "flip" phones in which the radiating device makes close contact with the skin are well below the 1992 ANSI/IEEE SAR of 1.6 W/kg. See Motorola Comments at Appendix E. Moreover, as many of the commentors noted, there are no valid reports of any harm coming to individuals who used handsets conforming to the current, less restrictive 1982 guidelines.

Despite the body of evidence suggesting that the 1992 ANSI/IEEE guidelines may be fairly conservative compared to the current exposure standard, COMSAT generally supports the adoption of new measurement criteria for the detection of RF radiation levels in handheld devices. COMSAT agrees in principle with the proposal to employ a SAR test as the definitive safety standard for handheld devices because such devices typically contain a radiating structure operating within a distance of 2.5 cm or less from the body. Moreover, the SAR test is a definitive, physical

biomedical measurement of the heating levels of internal tissues when exposed to RF devices which are operated close to the skin. COMSAT concurs with commentors which have noted the difficulties, expense and specialized equipment necessary to accurately assess the 1992 ANSI/IEEE SAR levels, and recommends, along with these commentors, that the Commission designate one, or more, qualified independent laboratories to make these measurements. See, e.g., Comments of TIA at 11.

COMSAT supports the extension of a categorical exclusion for portable or vehicular RF satellite devices, such as Inmarsat terminals, when such terminals operate at a sufficiently low power and have a radiating structure that is separate from the handset. Portable satellite terminals, like cellular or paging antennas, cannot readily be configured so as to cause harm to human tissue.

The latest model portable satellite terminals consist of a briefcase-size device with an antenna system embedded in the lid of the briefcase. The terminal can be operated only when the briefcase is open and the unit is pointed in azimuth and roughly in elevation towards the satellite and there is no obstruction in its line of sight. The person operating the terminal talks into a separate handset held to his or her head while operating a keyboard inside the suitcase opposite from the antenna structure in the lid. When an obstruction blocks the satellite signal to the antenna, the loss of received signal causes the transmitter to be cut off and all RF radiation ceases. Accordingly, there is

little possibility for direct, or even close, contact with human tissue from the radiating structure of a portable satellite terminal.

In conjunction with extending the low-power exclusion to portable satellite terminals, COMSAT urges the Commission to treat these devices under guidelines established for operations in a "controlled" environment. The 1992 ANSI/IEEE guidelines define controlled environments as locations where exposure may be incurred by persons who are aware of the potential for exposure through their employment or otherwise. In contrast, uncontrolled environments usually involve exposure to the general public. In the vast majority of cases, the users of Inmarsat portable satellite terminals operate the terminals for commercial, emergency or government purposes in employment situations in which the potential RF exposure is fully perceived and the operator has some training in the use of the equipment. The general public typically is not at risk from these devices. Moreover, as indicated above, the separation of the radiating antenna structure from the handset and the terminal's automatic shut-off function prevent RF exposure to persons operating the terminal or to bystanders in close proximity to it.

COMSAT also believes that the Commission should request the ANSI/IEEE to clarify two other basic technical matters before the Commission formally adopts the 1992 ANSI/IEEE guidelines. First, the MPE and low-power exclusion formulas should be modified to contain the same upper frequency limits. At present the MPE

formula has a cut off of 3000 MHz, while the low-power exclusion formula has an upper limit of only 1500 MHz. Thus, the frequency limit for the low-power exclusion contained in the 1992 ANSI/IEEE guidelines should be made consistent with the operation of PCS devices which may transmit up to a frequency limit of 2200 MHz.[2] Because PCS will be deployed in the very near future, it would be useful to extend the 1992 ANSI/IEEE frequency limit to at least 2.2 GHz. See Motorola Comments at 11.

Second, COMSAT agrees with TRW and Northern Telecom that the intent of the 1992 ANSI/IEEE guidelines for low-power exclusion (either controlled or uncontrolled) is to calculate radiated power on a time-weighted average rather than on a peak power basis. See Comments of TRW at 7; Comments of Northern Telecom at 3. This conclusion is supported by the stipulation in the 1992 guidelines of six minute or thirty minute averaging times for controlled and uncontrolled MPEs respectively. Moreover, from a health physics standpoint this conclusion is fully consistent with SAR safety limits, which are validated by measuring an increase in temperature of internal human tissue due to the absorption of the average power in the incident radiofrequency field.

Finally, COMSAT concurs with the numerous commentors who suggested that the Commission preempt state and local authorities from adopting additional RF exposure standards. See, e.g.,

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[2]See Second Report and Order, Gen Docket No. 90-314, 8 FCC Rcd 7700, para. 192 (1993).

Comments of AMSC at 14. New communications technologies such as personal communications services and mobile satellite services will operate on a national or regional scale. Some, like Inmarsat, will even operate globally. Given the scope of these markets, a unified national RF exposure standard is essential to the growth and competitiveness of these new industries.

CONCLUSION

COMSAT urges the Commission to adopt the new 1992 ANSI/IEEE RF exposure guidelines with the clarifications noted herein regarding SAR measurements for handheld devices and the treatment of portable satellite terminals with non-radiating handsets.

Respectfully Submitted,

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CERTIFICATE OF SERVICE

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